

## PATENT ABSTRACTS OF JAPAN

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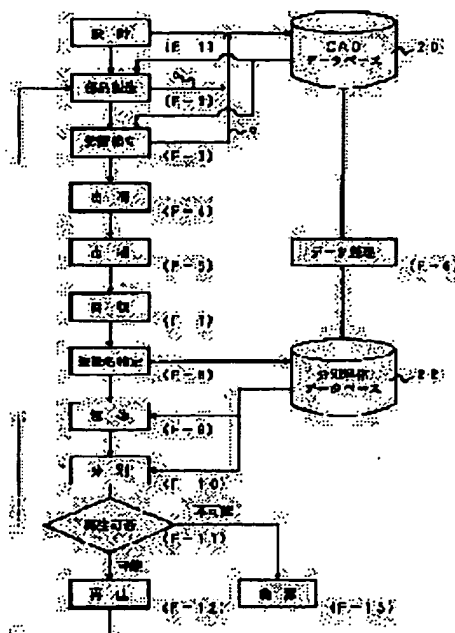
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## (54) TREATMENT OF RECOVERED ARTICLES

## (57)Abstract:

**PROBLEM TO BE SOLVED:** To reduce a cost and man-hours, to easily automate a treatment and to accelerate recycling by building the method for treatment of products by using the CAD data of products in a CAD system used at the time of designing and producing the products.

**SOLUTION:** The production of parts is executed by referencing a CAD data base 20 (F-2) and apparatus assembly is executed (F-3). Disassembly procedures, etc., for classification and recovery are arranged in accordance with the CAD data and the data are rearranged (F-6) to build the data base 22 for classification and disassembly. When the products are recovered (F-7) from markets (F-5), the products are specified (F-8). The results thereof are sent to the data base 22 for classification and disassembly, and the shapes, material quality, disassembly work, etc., of the parts of the products (apparatus) are determined. The products are disassembled (F-9) and are classified (F-10). Whether the reutilization is possible or not is discriminated (F-11). The products which are reutilizable (F-12) are sent through a regenerating stage to a parts producing stage (F-2). On the other hand, the products judged to be nonutilizable are discarded (F-13).



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**CLAIMS**

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**[Claim(s)]**

[Claim 1] The art of the recovery article characterized by building the art of this product using the design of a product, and the CAD data of this product in the CAD system used at the time of manufacture.

[Claim 2] The art of the recovery article characterized by building the part another solution object process of having a suitable throughput by the time it presumes the scale and capacity of a process which the judgment demolition after recovery of the aforementioned product takes using the aforementioned CAD data and these products are collected from a commercial scene.

[Claim 3] The aforementioned CAD data are the art of the recovery article according to claim 1 characterized by including the kind of member, the quality of the material, and an erector method.

[Claim 4] The art of the recovery article according to claim 1 or 3 characterized by having built the database which fitted the art from the aforementioned CAD data, and constituting an art from this database.

[Claim 5] The art of the recovery article characterized by carrying out demolition processing using the art of a recovery article given [ the collected aforementioned product ] in any 1 term of claims 1, 3-5.

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**DETAILED DESCRIPTION**

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to the art of a recovery article which can realize promotion of the increase in efficiency of a demolition, and the improvement in judgment precision and recycling especially about the art of the product collected from the commercial scene.

[0002]

[Description of the Prior Art] It is becoming an important thing from viewpoints, such as a deployment of resources, and reduction of waste, to collect them, and to take out and reuse an usable member, when the product which has appeared on the market in the commercial scene reaches a life and is discarded.

[0003] However, since the quality of the material which the product of a countless kind and parts exist and is constituted migrates to a commercial scene actually at varieties and the product is manufactured by various kinds of methods of construction, judgment of a thing with which part is reusable and efficient disassembling a product how further is very difficult for the actual condition. Therefore, when had to disassemble a product, or it had to depend for many of work which classifies the disassembled member on a help, and costs became huge and a mistake arose in work or a classification, the problem of reproduction and harmless-izing becoming impossible etc. was also inherent.

[0004]

[Means for Solving the Problem] After the fundamental ideas of this invention are collected about processing of the collected product, they perform the part another solution object applicable to the reverse process using the CAD data of the product created paying attention to [ rather than newly building the demolition method etc. ] the data of a considerable amount already exist in the stage of manufacture at the time of manufacture.

[0005] That is, many products are designed using the present CAD system, parts are further manufactured using a CAM system etc. based on it, and it is completed through the automatic assembling line etc. Then, we collected the CAD data generated in process of design manufacture, and decided to build the optimal judgment demolition art of the collected product using these CAD data.

[0006] Furthermore, judgment of the product collected, the scale of the processing needed for demolition, capacity, etc. are presumed using the CAD data at the time of a design and manufacture, and a suitable recovery system is accurately built, before actually collecting products. That is, from the life of a product, the recovery of a product, the existence of the consumables which are not reusable, the demolition method, etc., it asks for the amount of the product collected, recovery time, etc., and the processing means for judgment of a product, demolition, etc. is built according to the actual recovery time of a product, a scale, etc. Down stream processing which is not vainly by this can be prepared beforehand.

[0007]

[Embodiments of the Invention] The flow of the art in this invention is shown in drawing 1.

[0008] First, in case a product is designed (F-1), it designs using the CAD system which can specify the method of assembling each quality of the material, configuration, and each part article of parts, the CAD data is collected, and the database 20 of the product is built.

[0009] namely, when the design of a product is performed using a CAD system It is also related with the method of the data being left behind in a certain form, and assembling not only the design of each parts but them, and completing as equipment and a product. A design can be advanced using a CAD system, and when it is consistent in this way and a CAD system is used, all records until it results [ from a design start ] in manufacture and assembly will be left as data. Not only the configuration of parts but the method of construction applied on the classification of the material currently used and the occasion of assembly is contained, and the CAD database 20 is built there using these.

[0010] Next, with reference to this CAD data, part manufacture is performed using a CAM system etc. (F-2), and when information occurs at the time, it adds to the CAD data which became origin (a).

Furthermore, equipment assembly is performed using this CAD data (F-3), and if there is information generated there, it will add further (b). Moreover, depending on the case, a demolition procedure etc. is packed into collection by type based on these CAD data, the work which rearranges data is done (F-6), and the judgment demolition database 22 is built.

[0011] In addition, in the design of each part article, a drawing number etc. performs the mark which can specify the parts and assembly as much as possible. Moreover, since a 2-dimensional CAD system only creates a drawing in this case, the three-dimensions system which can also define the configuration and the assembly method of parts correctly is more desirable.

[0012] If a product is shipped (F-4) and products are collected from a commercial scene (F-5) (F-7), first, with viewing, image-recognition equipment, etc., a product name is read in a face plate etc. and a product is specified (F-8). The result is sent to the judgment demolition database 22, required data are searched, and it asks for the configuration of the parts of the product (equipment), the quality of the material, a demolition, etc.

[0013] After that, operate an automatic demolition line based on these data, and a product is disassembled (F-9). And the disassembled member is classified separately (F-10), it distinguishes whether it is reusable (F-11), a reproducible thing (F-12) is sent to a part manufacturing process (F-2) through a reproduction process, and a judging [ that reproduction was impossible ]-on the other hand thing is discarded (F-13).

[0014] Next, preservation of concrete data is explained.

[0015] An example in the case of assembling the case of electronic equipment to drawing 2 </A> is shown.

[0016] In drawing 2, covering 2 \*\*\*\*s, it is concluded by 3, the insertion nut 4 is driven into a boss 7, and the state where the shield plate 5 pastes up further is shown in housing 1, and let the state where they were assembled be the housing assembly 6. Housing 1 and covering 2 are the products made of a resin, the configuration is designed by the CAD system and the part number is displayed on the front face. The name of the used resin is incorporated in the CAD data of this part. The shield plate 5 is metal and is saved to CAD data with the name of the material currently similarly designed and used by the CAD system. When a screw thread 3 and the insertion nut 4 are purchase articles, specification including the quality of the material is saved in the CAD database 20 as data.

[0017] Moreover, in designing the assembly method of each part article, it attaches with the assembly method and a position etc. is saved as data of a CAD system. That is, about covering 2, and concluding with four screw threads 3 and the direction to bind tight serve as data. [ conclusion ] Specification quantity, a placing method of construction, a placing position, and the placing direction serve as data, and, as for the insertion nut 4, an adhesion position, the adhesion direction, and the adhesion method serve as data in the shield plate 5.

[0018] As other examples, the assembly state of a substrate 8 is shown in drawing 3.

[0019] In here, LSI, such as the CPU socket 9, a gate array 10, and memory 11, a capacitor 12, resistance 13, a connector 14, etc. are soldered to a substrate 8, and CPU15 is inserted in the CPU socket 9. Information, such as a configuration of each part article mounted in the configuration of the substrate assembly 16, the quality of the material, or composition and its front face, a mounting position, the mounting direction, and the method of soldering, is saved by the CAD system as CAD data in a design stage. Moreover, the peculiar part number which can specify it is displayed on the front face of a substrate 8 according to processes, such as silk printing.

[0020] The component and structure of the CAD database 20 saved by doing in this way at drawing 4 are shown typically. The state by which it was shown in drawing 4 serves as master data of subsequent processing. The parts of a predetermined product are specified as this CAD data, and the configuration of all the parts currently used there, the quality of the material, the assembly method, etc. are brought together in it.

[0021] Furthermore, the method-of-construction quality-of-the-material database 18 for reference which collected individually the data about a method of construction or the quality of the material from this CAD data is built. The method-of-construction quality-of-the-material database 18 is shown in drawing 5. The demolition corresponding to a method of construction or the quality of the material in this method-of-construction quality-of-the-material database, processing, and the data about the reproductive method are \*\*\*\*\*. The data collection shown above is accumulated for every sub assembly, and it is continued until it results in the form of a final product.

[0022] Although it is also possible to use this CAD data in a form as it is, and to use it as data for reference of a before [ from recovery / demolition ], since not all the data used for a design, manufacture, and assembly necessarily have a form which can be efficiently searched in the case of reference in addition to not being the need, it changes, when required. For example, the detailed configuration of parts is excluded, and only the information on a part required for assembly is extracted and arranged, and is

resummarized. Therefore, in the data of a configuration, it is desirable to distinguish the part which participates in assembly or demolition, and the part which is not so. Moreover, since functions which attach a certain distinction to a configuration, such as a layer (layer) function and a group function, are equipped, you may use it for a CAD system.

[0023] To CAD data, unnecessary data are deleted, the data arranged and done are used as the judgment demolition database 22 with reference to the quality of the material method of construction database 18, and the component and structure are typically shown in drawing 6.

[0024] Furthermore, the shipment quantity of the product from CAD data and the total amount of the product which should be collected using the estimate of the life in a commercial scene are expected. By collating the judgment demolition database 22 with this value, the man day and the capacity of a processing facility which are needed for a demolition or ratoon crop business are expected, and it prepares, before actually starting recovery in a demolition process with the suitable throughput etc.

[0025] when the products manufactured and shipped were collected from a commercial scene, it mentioned above -- as -- first -- the product face plate -- viewing -- keeping silence -- it discriminates by the image-recognition function and the name of a product is specified. The judgment demolition database 22 is searched with the stage which has specified the product name. A method of construction is searched with referring to the judgment demolition database 22 serially after that, and the demolition method which suited it is searched for.

[0026] Moreover, when dissolving with an automation robot line etc., the information which becomes the basis of operation from this judgment demolition database 22 is pulled out. for example, the configuration of the parts concluded in case the covering 2 come [ was \*\*\*\*ed and ] out of and concluded in the housing assembly 6 is disassembled -- in addition, since a kind, a number, and the conclusion position and direction of a screw thread 3 are obtained, the automatic demolition by the robot etc. is made to perform based on these data. Moreover, in order to extract the insertion nut 4 currently driven in firmly, the place is pinpointed and you may make it extract a boss 7 using a press-working-of-sheet-metal machine.

[0027] Moreover, in the substrate assembly 16, it is inserted in the CPU socket 9 among each part articles mounted in the front face, and what has high reuse value can be distinguished and processed like the thing which can be removed not using a special tool, or CPU15. In order to comb soldering and to remove only specific parts, it can decompose alternatively by pinpointing the mounting position, melting solder by laser or piercing it with a press-working-of-sheet-metal vessel.

[0028] When dissolving by hand control or the help, the most suitable and safe demolition method can be shown to an operator. For example, if a bond strength, application area, etc. of adhesives which are used are known in case the shield plate 5 adhered to housing 1 is torn off, since the force required for demolition and the position which is the easiest to strip can be obtained, work is done safely and efficiently.

[0029] When the disassembled parts have child parts further, the part number displayed on parent parts is followed, and demolition is advanced further. moreover, an impossibility [ demolition ] or demolition -- it can know easily whether it resulted to the unnecessary stage

[0030] When demolition is completed, while use of the quality of the material of each part article etc. becomes clear, the judgment of being the quality of the material which can reproduce it is attained. It is possible indiscreet for every quality of the material the whole classification of parts or a sub assembly by this, and the object which can reproduce an unreproducible object at an abandonment process is sent to a reproduction process.

[0031]

[Effect of the Invention] According to the art of the above-mentioned recovery article, costs and the man day which are needed for the process which disassembles and reuses the product collected from the commercial scene can be cut down, and it can automate easily, and recycling can be promoted.

[0032] Moreover, automation of a judgment demolition is easily attained for failure reduction of work or judgment possible by the bird clapper.

[0033] Furthermore, suitable anticipation of the capacity which judgment demolition takes is attained, and can set up beforehand the useless processing preparation which is not.

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

**[Drawing 1]** It is the flow chart which shows the art of the recovery article of this invention.

**[Drawing 2]** It is the perspective diagram showing an example of the assembly of an electronic instrument.

**[Drawing 3]** It is the perspective diagram showing an example of the assembly of an electronic instrument.

**[Drawing 4]** It is drawing showing the database structure.

**[Drawing 5]** It is drawing showing a method of construction quality of the material database.

**[Drawing 6]** It is drawing showing the database structure.

**[Description of Notations]**

1 Housing

2 Covering

3 Screw Thread

4 Insertion Nut

5 Shield Plate

6 Housing Assembly

7 Boss

8 Substrate

9 CPU Socket

10 Gate Array

11 Memory

12 Capacitor

13 Resistance

14 Connector

15 CPU

16 Substrate Assembly

18 Method of Construction Quality of the Material Database

20 CAD Database

22 Judgment Demolition Database

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